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COMPUTERIZATION PROGRAMME OF UNIDO

Report of the working group of independent experts on the computerization of UNIDO* (Vienna, 11-14 February 1991)

Contents

	Paragraphs	Page
Letter of transmittal		1
I. SYNOPSIS AND SUMMARY OF RECOMMENDATIONS	1 - 12	1
II. LEGAL ASPECTS	13 - 26	2
III. MAJOR PROBLEMS IDENTIFIED AND RECOMMENDATIONS	27 - 37	3
No basis for decision to decentralize	27	3
No step-by-step plan or inadequate institutional cost and process review	28	3
Too much capacity in present mainframe	29 - 30	4
Office automation maintenance may be too expensive	31	4
Unfocused development effort	32	4
Archaic and inefficient applications and development methods	33	4
Single-vendor mindset narrows options and increases costs	34 - 35	4
Systems that do not improve the process	36 - 37	5
Annex: List of participants		6

LETTER OF TRANSMITTAL

Dear Mr. President,

I am pleased to submit to you the Report of the Working Group of Independent Experts on the Computerization Programme of UNIDO. Its technical contents is unanimously supported by all members of the Group.

The text of the report includes contributions from most members and has been formally discussed paragraph by paragraph. We ask you to excuse any awkwardness of style that results from this collective method of authorship. We have made a serious attempt to keep the text short, pertinent and free of jargon.

I hope the Industrial Development Board will find our report of value. We in turn would ask you to convey our thanks to all UNIDO staff whose co-operation with and assistance to us was praiseworthy. Without the help of the two excellent secretaries provided by the Department of Administration we could not have completed this work in such good time.

(Signed) Bernard Adamczewski
Chairman
Working Group of Experts on
Computerization of UNIDO

H.E. Mr. Ole Lonsmann Poulsen
President of the seventh session
of the Industrial Development Board

I. SYNOPSIS AND SUMMARY OF RECOMMENDATIONS

1. The working group of independent computer experts met in Vienna from 11 to 14 February to evaluate and make recommendations on the automation programme at UNIDO. Our review consisted largely of interviews with key staff and users and the examination of important documents.

2. There were 11 of us of diverse national, technical, and organizational backgrounds. Nevertheless, a considerable degree of unanimity on all major technical questions was achieved after the second day of work.

3. We have no confidence in the $44 million total cost estimate for the programme as currently conceived. We feel it derives from questionable assumptions. The lack of specific information did not permit the group to design technical alternative solutions for UNIDO. In the absence of such alternatives, it was not possible to attach financial values to them. The group therefore was not able at this time to respond to the President's

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desire for financial options for the computer programme. However, one expert considers that the part of the mandate of the Group relating to the financial aspects of the computerization programme of UNIDO needs further study. In consequence, this expert intends to submit as soon as possible her conclusions and recommendations on the financial aspects of the programme.

4. The automation programme overall is too capital intensive: too much has been invested in hardware and not enough in the professionals needed to make it productive. This imbalance has exacerbated considerably the growing pains that are normally associated with the introduction of automated systems. It has in some instances resulted in computer procedures whose marginal costs exceed benefits.

5. In order to make our recommendations useful we have made them as specific as possible. We were limited by the lack of the quality of the information available to us in a number of important areas. Furthermore, we did not believe extending our work would improve this situation.

6. We have identified a number of problems and make recommendations against each problem in this report.

Major problems identified:

- No basis for decision to centralize
- No step-by-step plan
- Too much capacity in present mainframe
- Office automation maintenance may be too expensive
- Unfocused development effort
- Archaic and inefficient applications and development methods
- Single supplier mindset narrows options and increases costs
- Systems that do not improve the process

7. Because of their urgency we would like to highlight two recommendations and present both here:

8. The immediate appointment of a two- or three-man team of independent consultants of unquestionable professional competence to analyse in detail UNIDO needs and establish an overall EDP development policy in line with the recommendations of our group. This is a critical task which will require at least 4 man/months of effort and could cost about $250,000.

9. We would like to draw the Board's attention to UNIDO's procedural timetable:

22-26 April 1991	Programme and Budget Committee, seventh session
1-5 July 1991	Industrial Development Board, eighth session
18-22 November 1991	General Conference, fourth session

10. If the recommendation by the consultants is to be available for consideration by the November General Conference, then the interim report has to be completed by 15 May 1991. Allowing them six weeks' work implies they need to be appointed and working by 1 April 1991.

11. No substantive changes in the present EDP departments should be made until the analysis mentioned above is completed and can be taken into account. The present procedures, maladroit as some of them are, can continue to serve UNIDO for not more than another 12 to 15 months. Therefore, the Board should not expect to see actual cost reductions for 6-12 months at least.

12. During the course of the review, many in our group developed a considerable sympathy for the EDP staff. They are trying to do what is typically a very difficult job in trying circumstances. Problems identified cannot be attributed exclusively to the EDP Department, but are a consequence of fundamental issues with respect to organization, management and technical judgements.

II. LEGAL ASPECTS

13. A key consideration in making our recommendations was the degree to which UNIDO had flexibility under its automation contracts. A review of the contracts leads to the conclusion that UNIDO has the right under the IBM contracts to request a change in the scope of the services and hardware provided by IBM. Such a renegotiation, however, should not be limited exclusively to the IBM contracts, but should also apply to other suppliers.*

14. There are two main contracts of UNIDO with IBM:

(a) System Integration (Mainframe), UNIDO contract No. 89/467;

(b) Facilities Management, UNIDO contract No. 90/335.

15. In the 7 December 1989 Mainframe Agreement, UNIDO agreed to acquire and IBM agreed to furnish an integrated turn-key solution for UNIDO's new data center for a fixed price. The contract was based upon IBM's proposal for the establishment of a UNIDO mainframe computer facility dated 5 October 1989 (including amendment letters as of 2 November 1989 and 14 November 1989) in response to UNIDO's request for proposal dated 7 September 1989 for the acquisition of the hardware and software of the mainframe computer for UNIDO.

16. The Mainframe contract (Section 7(c)) provides that either party "at any time during the Project" may request changes to the "Deliverables/Services". Section 1 of the contract defines Deliverables/Services to include hardware and software.

17. The party desiring such changes must give notice in writing to the other party of the desired changes. A written reply must then be given within a reasonable time, but "in any event not more than 45 days", stating "whether the change can be made and the effect the change will have on the schedule, on the price and/or on the terms and conditions". (Section 7 (c))

18. The Mainframe contract also has a Termination Clause (Section 8) that allows either party by

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* The group relied upon Mr. J. Levinson, who is an experienced lawyer.

written notice to the other party to terminate the contract for failure to comply with any of its terms and conditions, if such failure is not corrected within 45 days of the date of written notice having been given of the failure and of the intent to terminate.

19. Additionally, there is a General Clause (Section 12) which provides that either party shall be released from its obligations under this Agreement, "to the extent that it is prevented from performing them by circumstances beyond its control".

20. There is no contract provision which provides for a penalty to UNIDO for either termination under Section 12 or requesting changes to the "Deliverables/Services" under Section 7 (c) of the contract.

21. With respect to the Mainframe contract, then, in accordance with the specific provisions of the contract (Section 7 (c)), UNIDO can request a change in the scope of the contract, including both the hardware and software. Invoking Section 12 of the contract, relating to unforeseen circumstances, is more problematic. The question of what constitutes unforeseen circumstances would undoubtedly be highly controversial.

22. The Facilities Management contract includes a provision (Section 6) which is virtually identical to Section 7 (c) of the Mainframe Agreement. The Facilities Management contract includes a specific termination provision (Section 7). This provision allows termination of the contract on 31 December 1991 or 31 December 1993 "by giving 6 (six) months written notice to IBM, i.e. not later than 30 June 1991 and 30 June 1993, respectively".

23. Both contracts incorporate as an integral part of the contract UNIDO's General Conditions. The General Conditions provide for arbitration as the means of settling disputes under the contract.

24. In sum, both of UNIDO's main contracts with IBM permit UNIDO to immediately initiate a reduction in the scope of contract, although such a request is subject to negotiation with IBM. Additionally, the Facilities Management contract specifically allows UNIDO to terminate the contract upon giving six months' notice, prior to the possible termination dates of 31 December 1991 or 31 December 1993.

25. Both contracts also explicitly state that by entering into such contracts, UNIDO has not waived the immunities granted to it by the Headquarters Agreement with the Government of Austria and the United Nations Convention. There is no equivalent in Austria of the United States Foreign Sovereign Immunities legislation that makes a distinction between commercial and non-commercial activities of international organizations.

26. In addition to the two main IBM contracts, there are other contracts which relate to office automation and data processing that should be reviewed, notably the Wang Word Processing Lease Agreement and Maintenance Agreement. The Wang Lease Agreement includes a termination provision with specific penalty values for termination by UNIDO (paragraph 7). The Maintenance Agreement runs from calendar year to year and may be terminated by either party upon 30 days' notice to the other party with no penalty.

III. MAJOR PROBLEMS IDENTIFIED AND RECOMMENDATIONS

NO BASIS FOR DECISION TO CENTRALIZE

27. The GMO study recommending centralization of computing at UNIDO is not at all compelling. It is the Group's considered judgement that a centralized approach is very likely not the best one for UNIDO, especially considering the high costs of the centralized concept. We feel that any decision requires a substantive and complete analysis.

RECOMMENDATIONS

(i) Consultants should be engaged to perform a complete automation needs assessment for UNIDO. The analysis should be detailed and thorough and should review each existing and proposed application to determine if it could be done more effectively by a distributed processing scheme. The analysis should include costs, schedule and options for the use of distributed processing.

(ii) The consultants who are engaged for the complete assessment should also be asked to provide a more in-depth recommendation for an appropriate interim (two-year) sizing of the mainframe. This recommendation should be used as the basis for a negotiation of the contracts with the vendor.

NO STEP-BY-STEP PLAN

or

INADEQUATE INSTITUTIONAL COST AND PROCESS REVIEW

28. The process whereby individual software applications are decided upon and launched must be improved and institutionalized. It is apparent that a management review process is not now in effect. As a result it appeared to the group that application development efforts were sometimes being misspent on projects with little demonstrated merit while other projects with potentially greater impact were not given enough attention.

RECOMMENDATIONS

(i) UNIDO, taking into consideration its surroundings and the needs of the Member States, should prepare a plan which identifies the functions of the Organization at large, in a long-, short- and medium-term plan, which would allow the identification of its mission, objectives and strategies. It is on the basis of this master plan that UNIDO should implement projects, decide on investment, re-organization and on methods for follow-up and control.

(ii) A strategic information systems plan should be developed. This plan would co-ordinate information activities for the short and medium term, integrated with the organizational plan covering information and system needs, the functional model, data architecture, system architecture and strategy, training, priorities, costs and schedules. Procedures and priority criteria should be laid down in a handbook.

(iii) The systems plan should be reviewed periodically to validate achievement of objectives. The overall planning should be reviewed annually and approved by senior management of UNIDO.

(iv) An Acquisitions Committee reporting directly to the Deputy Director-General of Administration should be established. This Committee should meet periodically and all proposals for EDP investment should be justified to and approved by it. This Group should be formed by officials from EDP, budgeting management and user areas, as appropriate.

TOO MUCH CAPACITY IN PRESENT MAINFRAME

29. The mainframe is substantially underutilized. The figures with respect to current utilization provided to the Group are incomplete and misleading. Even accepting them at face value, however, the mainframe average utilization during prime time does not exceed 30 per cent. With proper management, a mainframe of half the size of the current processor (perhaps even less), should be adequate to service UNIDO's central processing needs today and for the foreseeable future.

30. Carrying excess capacity for an extended period of time, as appears to be the case, is very costly since facilities management and software licence fees etc. are tied to the size of the CPU.

RECOMMENDATIONS

(i) Using the outside consultants' recommendations on interim sizing, renegotiate with the vendor to establish possible cost savings by immediate downsizing.

(ii) If the first recommendation is not viable, explore the possibility of a mainframe swap with a third party.

(iii) Selling computer time cannot be considered a solution to an excess computer capacity problem of this magnitude.

OFFICE AUTOMATION MAINTENANCE MAY BE TOO EXPENSIVE

31. The maintenance of the office automation hardware appears to be more costly than one would expect. This may be the result of the monopolistic position of the maintenance supplier or may be due to the age of the equipment.

RECOMMENDATIONS

(i) Explore option of letting this contract to third party vendor. If Vienna has alternate suppliers of this type of maintenance, the contract should be re-let.

(ii) If the age of the office automation equipment is the cause of high costs, evaluate advanced replacement options as a possible overall cost saver.

UNFOCUSED DEVELOPMENT EFFORT

32. The central EDP operation's software development efforts are unfocused. A large percentage of staff time appears to be devoted to "fire fighting" and making quick fixes to existing systems. There is no system of control in place to regulate the level of outside demands placed on central EDP for either human or financial resources. As a result, staff are harried and have little time for forward planning. In this environment, priority is determined by the urgency of a requirement, not its importance.

RECOMMENDATIONS

(i) EDP should establish systematic rules and procedures for project development, including procedural and technical standards for design, programming, documentation and control. Procedures should also include provisions for user acceptance and pilot testing of projects. Benefits and costs should be formally assessed before full implementation so that decisions can be made at a relatively early stage as to whether a project should be continued.

(ii) Administration should establish a transfer of pricing scheme for computer development work done by central EDP on user applications. A scheme similar to the one being implemented at IAEA would help to regulate demand on central EDP.

ARCHAIC AND INEFFICIENT APPLICATIONS AND DEVELOPMENT METHODS

33. The existing set of applications software is old and cumbersome. Developing and modifying applications of this type is extremely labour-intensive. Modern software development tools can improve productivity of EDP staff dramatically and facilitate the creation of fully integrated applications. Trying to build well-integrated, easily maintained applications using primitive development tools and methods is futile.

RECOMMENDATIONS

(i) EDP should not make major extensions to existing applications;

(ii) EDP should make the use of CASE tools (Computer Assisted Software Engineering) compulsory for all applications;

(iii) EDP staff should be trained in the use of CASE tools and methodologies;

(iv) Wherever possible, all applications should be developed and implemented in an integrated manner.

SINGLE-VENDOR MINDSET NARROWS OPTIONS AND INCREASES COSTS

34. UNIDO has never really attempted to go beyond IBM Hardware/Software-based solutions. This has narrowed its options and it has not been possible for it to take full advantage of all modern technological developments. Because of this tendency, the option that it selected in the past often resulted in a cost-ineffective solution. Moreover, getting tied down to a single vendor prohibits future migration to other possible and cost-effective architectures. It is also likely to lead to integration problems when other pieces of hardware and software are acquired in the future.

35. This problem will continue unless UNIDO makes a commitment towards OPEN SYSTEMS supported by a wide

vendors. This may be possible by
g its existing staff and changing its
ent policy.

IDATIONS

) Standards should be established for operating environments, communications, networking, mainframes, mini-systems, desk tops and terminals. UNIDO should carefully evaluate all existing options, considering operational efficiency, UNIDO applications, productivity, etc., and to the extent possible stick to open systems standards.

(ii) UNIDO should recruit and hire EDP professionals with open systems knowledge and experience, particularly experience in more than one vendor environment.

(iii) Arrange retraining of existing staff in selected (standards) environments.

SYSTEMS THAT DO NOT IMPROVE THE PROCESS

36. The group noted a number of software systems that appeared to have a negligible or perhaps even a negative impact on operational efficiency. Most of the systems which have been examined by this group of experts do not produce real improvements in efficiency, as they are mere translations of existing procedures to a computerized environment (for example, forms which are typed by secretaries are afterwards introduced to the system by other people who retype what is already typed). If necessary to improve efficiency, administrative procedures should be revised when introducing automation.

37. No formal procedure is in place to review the effectiveness of automated systems in producing improvements to administrative procedure and reducing paper flow. Some of the systems we saw were ineffective because, despite their introduction, procedures of the parallel paper system were in no way modified to take advantage of the automation.

RECOMMENDATIONS

(i) Procedural changes required to achieve administrative and paper flow improvements through automation should be approved at the same time as the project is approved. Every proposal for a new development must include a description of the improvements and the benefits which are expected to be obtained. These objectives should always be quantified.

(ii) A system for auditing the results of automation projects should be established to measure the real achievements of new systems in relation to the quantified objectives previously agreed.

Annex

WORKING GROUP OF INDEPENDENT EXPERTS FUNDED BY MEMBER STATES
ON THE COMPUTERIZATION PROGRAMME IN UNIDO

List of Participants

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